

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTONNEW REPTILES AND BATRACHIANS COLLECTED BY  
DR. HUGH M. SMITH IN SIAM.

BY DORIS M. COCHRAN.

From 1923 until the spring of 1927 the collections of the United States National Museum have been enriched by a wealth of scientific material collected by Dr. Hugh M. Smith, formerly the head of the United States Bureau of Fisheries in the Department of Commerce, now adviser in fisheries to the Siamese Government and director of the Siamese Department of Fisheries. Each shipment of material from him contains specimens which are profoundly interesting and valuable to science. A complete report on the reptiles and batrachians collected by him is about to go to press;—in the mean time full descriptions of three frogs, four lizards and a snake, all new to science, have been prepared as a stimulus to further collecting in the type-localities.

The genus *Chirixalus*, established by Boulenger in 1893 on the finding of a frog with opposed fingers in Burma, must now be united with the genus *Philautus* since the discovery by Dr. Malcolm Smith of *Philautus palpebralis*, which has the first two fingers partially opposed to the others. I am now describing two species with opposed fingers, *nongkhorensis* and *hansena*, which serve to bridge even more completely the supposed gap between the two genera.

***Philautus nongkhorensis*, new species.**

*Diagnosis.*—Snout pointed, with a distinct prominence at the extreme tip; skin of head, back and sides with small, round, scattered warts, which are most numerous and largest on the snout; tibio-tarsal articulation reaching tip of snout; interorbital space broader than upper eyelid; first two fingers opposable to the last two.

*Type*.—U. S. National Museum No. 70108, adult male collected at Nong Khor, southeastern Siam, on October 5, 1925, by Dr. Hugh M. Smith.

*Description of the type*.—Habit stout. Tongue free and deeply notched behind; no papilla; choanae small, rounded, almost entirely hidden by the edge of the jaw. Head large, as broad as long; snout shorter than diameter of orbit, pointed, with a distinct prominence at the extreme tip, this prominence very evident in profile; canthus rostralis very distinct; loreal region slightly concave, vertical; nostrils much nearer tip of snout than eye, the region above each nostril swollen and prominent; interorbital region broader than upper eyelid; tympanum about one-third the diameter of eye; first two fingers opposable to the last two; a small but distinct web present, this web largest and most apparent between the outer pair of fingers and fringing all the fingers nearly to the disks; fourth finger reaching to the center of the disk on the third finger; disks of the third and fourth fingers as large as the tympanum, of the first two fingers smaller; toes two-thirds webbed, the web extending to the disks, which are a little smaller than the tympanum; subarticular tubercles well developed; a small blunt inner metatarsal tubercle; tibio-tarsal articulation reaching tip of snout; skin of head, back and sides with small round scattered warts which are most numerous on the snout; throat and thighs finely granular, belly coarsely granular; a glandular fold extending from the superciliary region to the shoulder; other glandules at the corner of the mouth and on the shoulder; a large external vocal sac.

*Coloration*.—Dorsal surface pale purplish buff, with an indistinct darker pattern beginning as a cross-bar on the head through the middle of the upper eyelids, followed by a dusky median blotch which fades out shortly after it reaches the level of the shoulders; very fine gray dots over the entire upper surface, including arms and legs, which have in addition some suggestions of indistinct dusky bars; a few very irregular dusky markings on the back; above the vent a white line bordered below by grayish dots; throat and belly immaculate white; lower surfaces of legs cream color.

*Dimensions of the type*.—Snout to vent, 28 mm.; breadth of head, 10 mm.; eye, 45 mm.; height of tympanum, 1.5 mm.; fore limb, 17 mm.; hand, 8 mm.; hind limb, 39 mm.; tibia, 14 mm.; foot, 11 mm. Nine additional specimens were taken at the same locality.

*Remarks*.—The variation in the nine paratypes from the same locality is not great. A female, 70099, the largest in the lot, measures 32 mm. in length. In this individual the webbing between the third and fourth fingers is a good deal deeper than in the type specimen. The roughened warty skin is evident in all the frogs, this being particularly noticeable in 70104, where there are warts or glandules even on the arms and legs. This rough skin will serve at once to distinguish *nongkhorensis* from Boulenger's *doriae*, which he characterizes as possessing a smooth skin. The pointed snout with the queer projection on the end of it will differentiate my species from *simus* of Annandale, which possesses a truncated snout, but has a warty head as in *nongkhorensis*. The color variation among the paratypes is not great, for although some are a little darker than the others, the pattern is indistinct in all of them, with the exception of the crossband

between the eyes, and—in three examples—the faint traces of another dark band just back of the nostrils.

Dr. Malcolm Smith was the first to secure this species at Nong Khor, but he identified it with *Chirixalus doriae* (Proc. Zool. Soc. London, 1924, p. 226); I believe, however, that the two species are truly distinct.

***Philautus hansenae*, new species.**

*Diagnosis.*—Fingers free, the first two opposed to the other two; upper part of body smooth; tympanum distinct, one-half of the diameter of the eye; throat perfectly smooth; interorbital space much broader than the upper eyelid; inner metatarsal tubercle very small and inconspicuous.

*Type.*—U. S. National Museum, No. 70109, adult male, collected at Nong Khor, southeastern Siam, on October 4, 1925, by Dr. Hugh M. Smith.

*Description of the type.*—Habit slender. Tongue deeply nicked behind; no papilla; choanae small, rounded, partly hidden by the edge of the jaw; head a little longer than broad, moderately depressed. Snout obtusely pointed, projecting beyond the mouth, a little longer than the eye; nostril nearer the tip of the snout than the eye; canthus rostralis distinct; loreal region nearly vertical, concave; interorbital space much broader than the upper eyelid; tympanum fairly distinct, a little less than one-half the diameter of the eye, its distance from the eye somewhat less than its own diameter. First two fingers opposed to the others; the outer two fingers bound together to the proximal end of the penultimate phalanx, and with the merest vestige of a web between them, the fourth finger reaching to the disk of third; the second finger only half as long as third; disks as long as broad, those of the third and fourth fingers as large as the tympanum. Toes half-webbed, their disks smaller than those of the fingers; subarticular tubercles well developed; palm of hand with numerous flattened granules; inner metatarsal tubercle very small and inconspicuous; no outer tubercle; outer metatarsals separated at the distal end only. The tibio-tarsal articulation reaching to the nostril. Skin quite smooth except on the belly and lower aspects of the thighs where it is coarsely granular; a feeble fold above and behind the tympanum; an internal vocal sac.

*Coloration.*—Ground color creamy yellow above and below; the lips lighter; a very distinct white stripe starting at the tip of the snout, continuing backwards on the canthus rostralis to the eye, then widening behind the eye and continuing as a broad, definite dorso-lateral stripe up to the insertion of the hind legs; the entire surface excepting throat and belly thickly dotted with minute reddish dots which are most closely set at the upper and lower margins of the white dorso-lateral stripes; an interrupted dorsal series of dark elongate spots; a round bright blue spot on each side of the back about on a line with the insertion of the hind legs; a few indistinct traces of dark cross-bars on the tibia.

This species is named in honor of my friend, Miss Dora Hansen.

*Dimensions of the type.*—Snout to vent, 21 mm.; breadth of head, 6.5 mm.; eye, 3 mm.; height of tympanum, 1.5 mm.; fore limb, 13 mm.; hand, 7 mm.; hind limb, 33 mm.; tibia, 12 mm.; foot, 9 mm. Seven additional speci-

mens were taken at the same locality. One other came from Ban Sadet, collected May 30, 1925.

*Remarks.*—Among the eight paratypes the variation in color pattern is great indeed. One female, 70114, has no dark markings whatsoever, the whole back being peppered with fine reddish dots which are closer together as they approach the margins of the lateral white stripes. Another frog, 70113, also a female, appears to be a ruddy fawn color above, set off by three series of sienna spots, one median starting on the tip of the nose, the other two on the dark upper margins of the lateral stripes; on this specimen the fine dots are not so evident on the back; it is only below the lateral white stripe that they stand out at all conspicuously from the background color. This frog has a few irregular dark patches on the femur, as well as quite a number of them on the tibia.

A sexual difference in length of legs is quite apparent in this series. The tibio-tarsal articulation of all the males easily reaches to the nostril, while in the females it reaches only to the anterior border of the eye or a little beyond.

The female from Ban Sadet taken May 30, 1925, contains a number of rather large eggs. The three females captured October 4 and 5 of the same year are obviously full of eggs, and when one of them was dissected, the eggs were found to be about the same size as those of the Ban Sadet female. The length of the largest female is 23 mm.

The tympanum is very distinct, though small, on nearly all of the specimens. In two of them it is not so distinct because it is more nearly the color of the surrounding skin, although it can be readily outlined when the frog is placed in a different light.

From *Philautus palpebralis* this new species differs in having a much broader interorbital space; in having the tympanum usually quite distinct; in possessing a relatively short second finger and a very long third finger, while the third and fourth are bound together for a much greater proportion of their length; and also in coloration. The fingers of *hansena* are much more opposed than seems to be the case with *palpebralis*;—so much so, in fact, that it is hard to uncurl them in the alcoholic specimens under examination.

From *doriae*, *hansena* differs in having the snout longer than the eye and in having a more slender body.

From *nongkhorensis*, *hansena* differs likewise in slenderness of body as well as in having a smoother skin.

#### *Microhyla malcolmi*, new species.

*Diagnosis.*—Interorbital space as wide as upper eyelid; skin rough; toes entirely webbed; two metatarsal tubercles, the outer much the larger and shovel-shaped; a large tarsal "shovel."

*Type.*—U. S. National Museum, No. 72172 (collector's number, 2328), an adult female collected at Pak Jong, Siam, on November 15, 1925, by Dr. Hugh M. Smith.

*Description of the type.*—Habit moderately slender. Snout very blunt and obtuse, shorter than the orbit; interorbital space as broad as upper

eyelid. Fingers long, slender, with very small disks; third and fourth fingers bound together up to the first joint; second finger much longer than the first, and about half the length of the third; toes long, webbed completely to their tips, which are dilated into rather large disks; the upper surfaces of the tips of the toes flattened and with a central depression, but without any actual median cleft; subarticular tubercles prominent; a distinct inner and a greatly developed shovel-like outer metatarsal tubercle; on the tarsus a very large "shovel," fully as long as the first toe. The tibio-tarsal articulation reaches far beyond the tip of the snout; tibia more than two-thirds the length of the head and body. Upper parts with many short, glandular ridges which are most numerous on the sides; a long glandular ridge along each side from above the arm nearly to the groin; three rows of glands on top of the head, the outer two extending from the snout to behind the eye, the middle one to still farther down the back; lower parts smooth; no granules about the vent.

*Coloration (in alcohol).*—Purplish-gray above, with a large dark angular blotch in the middle of the back; an irregular black spot above the forearm; a series of irregular black spots just below the glandular lateral ridge; a few scattered black spots on the front of the femur; a black patch above the vent on either side; a black line running along the inner face of the tarsal "shovel" and continuing down the tarsus to the metatarsal region; bottoms of feet black. A light area below the eye; a light streak from the posterior corner of the eye to the shoulder, bordered above and below by black. Throat and chest gray with many small white spots; lower aspect of thighs and legs pinkish-orange, their upper aspect dark purplish-gray, with very indistinct darker bandings. Snout to vent, 35 mm.; tibia, 26 mm. Type unique.

I take pleasure in naming this species for Dr. Malcolm A. Smith, now of Surrey, England, whose interest in Siamese reptiles and amphibians during his many years of residence in Bangkok has added so greatly to our knowledge of the fauna of Malaysia.

*Remarks.*—The type is as yet the only known example of this very remarkable species. It is a female, apparently fully grown, and contains a great many eggs.

This species resembles *Microhyla berdmorei* in possessing fully webbed toes. It is not close even to *berdmorei*, however, for it has no median cleft on the upper surface of the toes. It has also a much blunter snout and a much narrower interorbital space, while the tarsal "shovel," though suggested in *berdmorei* by a slight and hard protrusion on the tarsus, is carried to a relatively immense degree of development in *malcolmi*.

#### ***Sphenomorphus helenae*, new species.**

*Diagnosis.*—Limbs well developed, pentadactyle; ear opening distinct, as large as the eye opening, without lobules; lower eyelid scaly; no supranasals; the limbs meet and overlap very slightly when pressed against the body; 30 scales around the middle of the body; 3 pairs of enlarged nuchals; 17 lamellae under the fourth toe; 4 supraoculars.

*Type*.—U. S. National Museum No. 67265, collected at Nontaburi, Siam, by Dr. Hugh M. Smith on September 2, 1923.

*Description*.—Habit lacertiform; limbs well developed, pentadactyle; the length of the hind limb exceeds the distance between the center of the eye and the fore limb; the distance between the end of the snout and the fore limb contained  $1\frac{3}{8}$  times in the distance between axilla and groin. Snout short, obtuse; loreal region nearly vertical; a single anterior loreal shield. Lower eyelid scaly. Nostril pierced between a nasal and a postnasal; no supranasal; rostral convex, forming a broad suture with the frontonasal, which is a little broader than long and forms a narrow suture with the frontal, thus separating the prefrontals; frontal slightly narrower than the supraoculars, shorter than the frontoparietals and interparietal together, in contact with first and second supraoculars; four large supraoculars, first and second equal in length, the third shortest; six supraciliaries, first largest; frontoparietals and interparietal distinct, equal in length; the parietals forming a short suture behind the interparietal; three pairs of enlarged nuchals; fifth and sixth upper labials largest, the suture between them below the center of the eye. Ear-opening distinct, oval, as large as the eye-opening; no auricular lobules. Thirty smooth scales around the middle of the body, laterals slightly smaller than the dorsals, which are all quite uniform in size; caudal scales perfectly smooth. A pair of large preanals. The adpressed limbs overlap very slightly, the tip of the fourth toe just reaching to the tip of the fifth finger. Digits of fingers not compressed, of toes only very slightly, none especially elongated; subdigital lamellae smooth, seventeen under the fourth toe. The tail (partly reproduced) very slightly longer than head and body, the scales beneath it enlarged.

*Coloration* (in alcohol): Above yellowish-brown with scattered dots of slightly darker color; a dark brown lateral band beginning on the tip of the snout and continuing along the side of the head and over the ear, widening considerably at the shoulder and margined above by a light area for its entire length; from the shoulder onwards the dark band is broken up by short transverse spots of the light ground-color, until on the tail it appears as an irregular dark-brown line with invading areas above and below; a median dorsal stripe beginning on the neck, much narrower and less conspicuous than the lateral stripes, and breaking up into numerous irregular brown spots which are continued onto the tail; upper surfaces of arms and legs also brown- and yellow-spotted; labials and sides of head, body and tail spotted with minute grayish dots; entire under surface immaculate white.

*Dimensions of the type*.—Total length, 58 mm.; head and body, 28 mm.; tail (partly reproduced), 30 mm.; center of eye to shoulder, 8 mm.; hind limb, 10.5 mm.; end of snout to fore limb, 10.5 mm.; axilla to groin, 14.5 mm.; fore limb, 7 mm. The type is unique.

I take great pleasure in naming this species for my friend Mrs. Helen T. Gaige, of the Museum of Zoology at Ann Arbor, Michigan.

*Remarks*.—The nearest relative to *Lygosoma helenae* is undoubtedly *L. annamiticum* described by Boettger (Ber. Senckenberg. Nat. Ges., 1901,

p. 47) which was collected in Annam. The main difference between the two is in the proportions of the first two supraoculars,—in *annamiticum* the first supraocular is nearly double the length of the second, while in *helenae* the first and second supraoculars are about equal in length, the second, if either, being slightly the longer. Then, too, *annamiticum* is the larger-scaled of the two species, possessing 24 scales around mid-body, while *helenae* has 30 at that point. The subdigital lamellae are different, also, there being 20–22 in the species from Annam, while there are only 17 in my new species. The frontal scale seems to be much longer in the Annam species, for Boettger states it to be as long as frontoparietals and parietals together, while in *helenae* the frontal is only two-thirds that distance, and even falls short of equalling the length of interparietal and frontoparietals together. The median dorsal scale-rows are said to be very broad in *annamiticum*, while in *helenae* the 8 rows of scales covering the back are uniform in size and grade evenly and insensibly into the smaller laterals. The coloration is still another separating character, for in *annamiticum* the under surface is marked with black spots while in *helenae* it is immaculate; and there are three broad dark stripes in the former species, which in the latter are reduced to two rather strong lateral stripes and a very weak and indefinite dorsal stripe.

The two species are similar in possessing enlarged nuchal and preanal scales, the same number of supraoculars, and a large ear-opening. Apparently *helenae* has no near relatives on the mainland with the exception of Boettger's species with which I have just compared it.

#### *Sphenosoma hughi*, new species.

*Diagnosis.*—Limbs well developed, pentadactyle; frontoparietals two; rostral separated from frontonasal by a pair of supranasals which are perfectly distinct from the nasals; lower eyelid scaly; 28 scales around the middle of the body, the dorsals with 5 low keels, the outer being very indistinct; no enlarged nuchals; frontal slightly longer than interparietal and frontoparietals together; hind limb measures about half the distance from axilla to groin.

*Type.*—U. S. National Museum No. 72275 (collector's number 2941), taken at Koh Tao, Gulf of Siam, by Dr. Hugh M. Smith on January 1, 1927.

*Description of the type.*—Distance between the end of the snout and the fore limb  $1\frac{3}{4}$  times in the distance between the axilla and groin. Limbs well developed, pentadactyle, not meeting when adpressed. Snout obtuse; lower eyelid scaly; supranasals completely separated from the nasals and in contact behind the rostral; frontonasal much broader than long, forming a broad suture with the frontal; prefrontals small and widely separated; frontal slightly longer than the interparietal and frontoparietals taken together; the frontoparietals and interparietal distinct, the latter slightly the smaller; parietals forming a suture behind the interparietal; no enlarged nuchals. Four large supraoculars; seven supraciliaries; seven upper labials, the fifth the largest and below the center of the eye,

longer than deep, about equal to the third and the fourth together. Second loreal twice as long as the anterior loreal. Ear-opening very small, roundish; 28 scales around the body, the dorsals with 5 low keels of which the outermost are barely discernible; lateral scales with very faint keels; preanal scales slightly enlarged. Digits moderate, compressed; fourth toe a little longer than third, with 14 bluntly keeled subdigital lamellae. Tail a little longer than head and body; the scales on top keeled, those beneath it not enlarged.

*Coloration.*—Bronze-brown above, fading to lighter brown below. Posterior dorsal scales tipped with dark brown; a dark brown streak beginning at the nostril and continuing backwards along the sides, gradually becoming lighter, as the dark pigment becomes restricted to the tips of the scales from the shoulder onwards. Sides of tail with light and darker spots irregularly scattered. Upper labials light brown without any spots on the sutures, but toned with dark brown at their entrance to the mouth. Dimensions of the type: head and body, 55 mm.; tail, 60 mm.; axilla to groin, 31 mm.; fore limb, 12 mm.; hind limb, 16 mm.; fore limb to center of eye, 14 mm.; fore limb to end of snout, 19 mm.

Two additional specimens were secured at the same locality. It gives me great pleasure to name this species in honor of its discoverer, Dr. Hugh M. Smith.

*Variations.*—the only essential difference in scalation in the heads of the two paratypes is in the upper labials. In 72274, the *fourth* is below the center of the eye on both sides of the head, measuring less in length, however, than the two labials preceding it. The same is true of 72276, so that it might almost seem that the type is abnormal in possessing 4 labials before the subocular, and that 3 is really the usual number. The posterior loreal is always much the longer.

All the specimens agree in having 28 scale-rows, and in the two paratypes the outermost keels on each scale are more easily distinguishable than in the type.

As might be expected, the smallest specimen has slightly longer legs in proportion to the distance from axilla to groin. The hind leg is only about  $1\frac{1}{2}$  times into that distance.

The coloration of 72276 is even more uniform than that of the type. The dark brown lateral band is obvious only to the shoulder; upon the sides and tail it is no longer distinguishable. No. 72274, on the other hand, is the most definitely colored of the three, for not only is the dark brown lateral band quite distinct almost to the hind leg, but it also has a lighter stripe bordering it above from behind the eye.

*Relationships.*—It can not be doubted that this species is very closely related to *Lygosoma herberti* Smith, from the Nakon Sritamarat in Peninsular Siam. The chief difference lies in the larger frontal in *hughii*,—the frontal being a little longer than the interparietal and frontoparietals together, while in *herberti* the frontal equals the length of the interparietal and the frontoparietals. The subocular scale in *hughii* is not excessively large, not being longer than the sum of the two scales preceding it, as is the case in *herberti*. The keels on the dorsals seem to be very much weaker in



*hughi*. There are no definite white spots on the sides, although as every scale is dark-bordered, the centers appear light.

It is less closely related to *bowringi*, for the latter species has a pair of enlarged nuchals and a pair of temporals, as well as only 3 indistinct keels on the dorsals, differing from *hughi* in all these respects.

***Leiopolisma eunice*, new species.**

*Diagnosis*.—Limbs well developed, pentadactyle, not meeting (or slightly overlapping on the young) when adpressed along the body; ear-opening distinct, nearly as large as the eye-opening, without projecting lobules; lower eyelid with an undivided transparent disk; no supranasals; fronto-nasal broader than long, forming a straight suture with the rostral; 2 frontoparietals; several pairs of feebly enlarged nuchals; 1 pair of enlarged preanals.

*Type*.—U. S. National Museum No. 72180, collected at Bang Suk, near Pak Jong, Siam, by Dr. Hugh M. Smith on August 19, 1926.

*Description of the type*.—Body elongate; the distance between the end of the snout and the fore limb contained (in the adult type) 2 times in the distance between axilla and groin; snout extremely short, obtuse; head depressed and flattened; lower eyelid with an undivided, transparent disk; nostril pierced in the nasal; no supranasals; frontonasal broader than long, forming a broad, straight suture with the rostral which is convex; prefrontals just touching each other; frontal narrow behind, considerably shorter than the frontoparietals and parietal together, in contact with the two anterior supraoculars; four supraoculars, the first and fourth longer than the second and third; six supraciliaries; frontoparietals and interparietal distinct, subequal in size; parietal forming a suture behind the interparietal; several pairs of feebly enlarged nuchals; the fifth lower labial falls below the center of the eye on the left side of head, the sixth on the right side. Ear-opening oval, distinct, nearly as large as the eye-opening; no auricular lobules; 34 smooth scales around the middle of the body, laterals smallest, those beneath the tail somewhat enlarged. A pair of enlarged preanals. The adpressed limbs do not meet, being separated by a distance equalling the length of the foot. Digits distinctly compressed, subdigital lamellae bluntly keeled, 18 under the fourth toe. Tail  $1\frac{1}{2}$  times the length of the head and body.

*Coloration*.—Above dark bronze, the neck and back with small scattered darker spots, which coalesce toward the posterior part of the body and on the beginning of the tail to form a dark median stripe. A narrow black band beginning on the snout, continuing above the ear and broadening above the shoulder, to continue along the sides and on to the tail; the borders of this band are unevenly invaded by lighter bars of color from above and below. Sides yellowish-gray, with some scattered black dots in front of the groin and extending midway to the arm. Lower surfaces of body and throat light gray, immaculate; underside of tail yellowish, dotted with minute brown specks. Lips light, their posterior edges usually with gray or black dots. Upper surface of limbs bronze, with heavy black mottlings. Dimensions of the type: Total length, 135 mm.; head and body, 53 mm.;

tail, 82 mm.; center of eye to shoulder, 13 mm.; hind limb, 16 mm.; end of snout to fore limb, 16 mm.; end of snout to posterior border of ear, 9 mm.; fore limb, 11 mm.; axilla to groin, 31 mm.

Two young specimens probably referable to this species were taken at Pak Jong, Eastern Siam, on May 18, 1925. This species is named in honor of my friend Miss Eunice E. Myers.

*Variations.*—The two young specimens (70271-2) taken at Pak Jong, Eastern Siam, on May 18, 1925, referred to this species, agree well with the type in head scalation, except that the frontal and interparietal plates are a little broader in proportion to their length than is the case in the adult type. In the smallest specimen, 70272, there is a small interpolated scale between the two frontoparietals, which prevents their meeting; the suture between the rostral and the frontonasal is not straight, but is slightly curved; and the adpressed limbs overlap somewhat. In the slightly larger specimen, 70221, the limbs barely overlap, while in the adult type the limbs fail to meet by a considerable interval.

In both of the young lizards, the congregation of black spots to form a distinct dark median stripe on the posterior part of the body and on to the tail is quite noticeable. The other color characteristics likewise agree with those of the type.

The several pairs of enlarged nuchals on each of the smaller specimens are much more pronounced than in the type, where some of the nuchals are divided into smaller scales. It is impossible to tell just how many pairs of nuchals there are, because they merge with the dorsal scales by regular gradations in size.

*Relationships.*—A comparison of my new species with *Leiolopisma laterale* can leave no doubt that the two are very closely related. The similarities in body-form and general appearance are at once evident. Both have the widened nuchals which reduce gradually to the size of dorsal scales, and the upper head shields are quite similar. The color pattern, however, is distinctly of a different style in the two species. In *eunice*, the dark lateral band is invaded by many little bars of the lighter color from above and below it; in *laterale* the band is reduced to a narrow dark line which is fairly even in outline above and is set out with a very light area above it, while below it the sides are of a uniform bronze hue, with no trace of vertical bars of light color. Neither are there any brown spots on the back in *laterale*, nor a median dark stripe on the body or tail.

The scales of *laterale* are larger and less numerous than is the case with *eunice*.

#### ***Leiolopisma kohtaoensis*, new species.**

*Diagnosis.*—Limbs well developed, pentadactyle, not meeting in the adults (or barely overlapping in the young), when adpressed along the body; ear-opening distinct, oval, a little smaller than the eye-opening, without projecting lobules; lower eyelid with an undivided, transparent disk; no supranasals; frontonasal broader than long, forming a straight suture with the rostral; 2 frontoparietals; nuchal region with one or more pairs of irregularly enlarged scales; 30 scales around the middle of the body, often

irregularly arranged in rows; frontal shorter than interparietal and frontoparietals together.

*Type*.—U. S. National Museum No. 72284, collected at Koh Tao in the Gulf of Siam by Dr. Hugh M. Smith on December 31, 1926.

*Description of the type*.—Body elongate, the distance between the snout and the insertion of the forelimb contained  $1\frac{2}{3}$  times in the distance between axilla and groin; snout short, obtuse; lower eyelid with an undivided, transparent disk; nostril pierced in the nasal; no supranasals; frontonasal broader than long, forming a straight suture with the rostral which is convex; prefrontals forming a median suture; frontal  $\frac{2}{3}$  the length of frontoparietals and interparietal together, in contact with first and second supraoculars; four large, subequal supraoculars; seven supraciliaries; frontoparietals and interparietal distinct, subequal in size; parietals forming a suture behind the interparietal; the suture between the fifth and sixth supralabials falls exactly beneath the center of the eye. Ear-opening oval, distinct, a little smaller than the eye-opening; no auricular lobules; on the nuchal region some irregularly enlarged scales; 30 smooth scales around the middle of the body, all the dorsal scales arranged rather irregularly and not absolutely uniform in size so that 31 or even 32 scales may be counted in places; lateral scales smallest; the median row of scales beneath the tail enlarged very slightly, but becoming very broad where the reproduced portion of the tail occurs. A pair of large preanal plates. The adpressed limbs do not meet (in the adult), being separated by a distance about equal to the length of the fingers. Digits rather short and scarcely compressed; lamellae very obtusely keeled, 16 under the fourth toe. Tail (reproduced) nearly as long as head and body.

*Coloration*.—Light bronze above, with irregular, scattered, dark brown spots on top of the head and in the centers of some of the dorsal scales. A dark brown band starting on the canthus, passing above the ear and widening on the shoulder, being broken regularly by little bars of the lighter bronze color invading it; on the tail this band becomes lighter, and is even more broken up into spots. The sides below this dark band are pinkish-yellow with a quite regular row of small dark brown dots along the lateroventral line. Arms and legs spotted and irregularly banded above. Under surfaces white, immaculate except for a few small brown dots on the throat. Lips light, spotted with brown. Dimensions of the type: Head and body, 44 mm.; tail (reproduced), 41 mm.; axilla to groin, 24 mm.; fore limb, 9 mm.; hind limb, 13 mm.; fore limb to center of eye, 12 mm.; fore limb to end of snout, 15 mm. Two additional specimens were secured at the same locality.

*Variations*.—The two paratypes, 72282 and 72283, were taken in the same place and at the same time as the type.

In 72282 the prefrontal suture is not so long as in the type specimen, while in 72283 this suture is comparatively very short indeed. The limbs meet and overlap slightly in 72282, the smallest of the three. In 72283, somewhat larger, the adpressed limbs can barely be made to touch, while in the type they are separated by a considerable interval.

Since the limbs of the two youngest lizards are relatively long, they are

likewise different when compared to the length from axilla to groin. The type is  $1\frac{3}{8}$ , the youngest  $1\frac{1}{8}$  and the middle-sized one  $1\frac{1}{8}$ .

The two paratypes have the interparietal a little larger than the frontoparietals.

In having the frontal shorter than the frontoparietals and interparietal measured together, the paratypes agree with the type. In the irregularity of scalation in the nuchal region and on the back they likewise resemble it. No. 72283 has a row of small scales behind the posterior border of the parietal plates; then follows a pair of enlarged nuchals, each of which is at least twice as wide as the irregular small scales which follow. In 72282 there are three pairs of enlarged nuchals immediately following the parietals, although these are irregularly shaped, and about  $1\frac{1}{2}$  times the width of the scales which they precede. The type possesses only two enlarged nuchals, both of which are on the left side of the neck and following the parietals.

In 72282 the fourth toes have 15 and 16 lamellae respectively; in 72283 there are 15 and 17 lamellae.

*Relationships.*—The relationships are most pronounced towards *L. melanostictum* Boulenger and *L. rupicola* Smith.

From *melanostictum* my new species differs in having the nuchals enlarged somewhat, and mainly in having considerably fewer scale-rows.

They agree in the relative proportion of the limbs and body, as well as in other essential characters.

From *rupicola* my species differs in having considerably shorter limbs, and in having fewer scale-rows.

They agree in having feebly enlarged nuchals; in having the frontal shorter than the interparietal and frontoparietals together, and I do not doubt that a relationship exists between these species.

#### *Callophis hughii*, new species.

*Diagnosis.*—One prae- and two postoculars; 7 upper labials; ventrals 285; a single temporal; body immaculate reddish-brown above, the extreme edges of each scale being powdered with minute gray dots.

*Type.*—U. S. National Museum No. 72307 (collector's number 2940), collected at Koh Tao, Gulf of Siam, by Dr. Hugh M. Smith on January 1, 1927, under rubbish in evergreen jungle.

*Description of the type.*—Eye as long as its distance from the mouth; rostral broader than deep; frontal as long as its distance from the end of the snout, much shorter than the parietals; one prae- and two postoculars; a single temporal; seven upper labials, third and fourth entering the eye; two pairs of chinshields, the anterior the larger and in contact with the first, third, fourth and fifth pairs of lower labials; second pair of lower labials much reduced in size, not reaching to the chinshields. Scales in 13 rows; ventrals 285; anal divided; subcaudals 27.

*Coloration.*—A note furnished by Dr. Hugh M. Smith states that in life the general color was "reddish-brown, lighter on belly; under side of tail light blue, with black spots; a black ring around neck, another near end of tail; throat bluish-gray. Never seen before."

In alcohol the posterior part of the belly still remains pink, and the tail

appears bluish-white. At the base of the tail is a complete black ring, then four very irregular spots on the under surface, and near the tip another black ring which does not quite meet on top of the tail. The top of the head is entirely black excepting for the outermost portions of the parietal region and the outer halves of the internasal plates which are light brown. The black "ring" does not extend completely around the neck but covers the nape and ends below and behind the commissure of the mouth. The body shows no trace of spotting or striping; it is uniformly reddish-brown above, the extreme edges of each scale being powdered with minute gray dots. The sutures between the anterior labials of upper and lower jaw are marked off by black, the most decided mark coming between the third and fourth upper labials. Back of this, the posterior labials remain entirely white. The belly is immaculate, the forward portion being cream color turning to pink posteriorly. Dimensions of the type.—Total length, 260 mm.; tail, 26 mm. The species is named for its collector, Dr. Hugh M. Smith. The type is unique.

*Remarks.*—From *maculiceps maculiceps*, its nearest relative, my new species differs in having a much higher number of ventrals, as well as in lacking the black dots along the back. It differs from Dr. Malcolm Smith's *maculiceps univirgatus* in the same characters, as *univirgatus* has a low ventral count of 173-198 and possesses a conspicuous black vertebral line, while *hughi*, with a high ventral count, is immaculate above.

